WHAT IS CLAIMED IS:

1. A nucleic acid molecule comprising a sequence of nucleotides that encodes an HPV58 L1 protein as set forth in SEQ ID NO:2, the nucleic acid sequence being codon-optimized for high-level expression in a yeast cell.

2. A vector comprising the nucleic acid molecule of claim 1.

3. A host cell comprising the vector of claim 2.

4. The host cell of claim 3, wherein the host cell is a yeast cell.

5. The host cell of claim 4, wherein the yeast cell is selected from the group consisting of: *Saccharomyces cerevisiae, Hansenula polymorpha, Pichia pastoris, Kluyveromyces fragilis, Kluyveromyces lactis,* and *Schizosaccharomyces pombe.*

6. The host cell of claim 5, wherein the host cell is *Saccharomyces cerevisiae.*

7. The nucleic acid molecule of claim 1, wherein the sequence of nucleotides comprises a sequence of nucleotides as set forth in SEQ ID NO:1.

8. A vector comprising the nucleic acid molecule of claim 7.

9. A host cell comprising the vector of claim 8.

10. Virus-like particles (VLPs) comprised of recombinant L1 protein or recombinant L1 + L2 proteins of HPV58, wherein the recombinant L1 protein or the recombinant L1 + L2 proteins are produced in yeast.

11. The VLPs of claim 10, wherein the recombinant L1 protein or recombinant L1 + L2 proteins are encoded by a codon-optimized HPV58 L1 nucleic acid molecule.

12. The VLPs of claim 11, wherein the codon-optimized nucleic acid molecule comprises a sequence of nucleotides as set forth in SEQ ID NO:1.

13. A method of producing the VLPs of Claim 11, comprising:

(a) transforming yeast with a codon-optimized DNA molecule encoding HPV58 L1 protein or HPV58 L1 + L2 proteins;

(b) cultivating the transformed yeast under conditions that permit expression of the codon-optimized DNA molecule to produce a recombinant papillomavirus protein; and

(c) isolating the recombinant papillomavirus protein to produce the VLPs of Claim 11.

14. A vaccine comprising the VLPs of Claim 11.

15. Pharmaceutical compositions comprising the VLPs of claim 11.

16. A method of preventing HPV infection comprising administering the vaccine of Claim 14 to a mammal.

17. A method for inducing an immune response in an animal comprising administering the VLPs of Claim 11 to an animal.

18. The virus-like particles of Claim 11 wherein the yeast is selected from the group consisting of *Saccharomyces cerevisiae, Hansenula polymorpha, Pichia pastoris, Kluyveromyces fragilis, Kluyveromyces lactis,* and *Schizosaccharomyces pombe.*

19. The virus-like particles of claim 18, wherein the yeast is *Saccharomyces cerevisiae.*

20. The vaccine of claim 14, further comprising VLPs of at least one additional HPV type.

21. The vaccine of claim 20 wherein the at least one additional HPV type is selected from the group consisting of: HPV6, HPV11, HPV16, HPV18, HPV31, HPV33, HPV35, HPV39, HPV45, HPV51, HPV52, HPV55, HPV56, HPV59, and HPV68.

22. The vaccine of claim 21, wherein the at least one HPV type comprises HPV16.

23. The vaccine of claim 22, further comprising HPV18 VLPs.

24. The vaccine of claim 23, further comprising HPV6 VLPs and HPV11 VLPs.

25. The vaccine of claim 24, further comprising HPV31 VLPs.

26. The vaccine of claim 23, further comprising HPV31 VLPs.

27. The vaccine of claim 25, further comprising HPV45 VLPs.

28. The vaccine of claim 26, further comprising HPV45 VLPs.

29. An isolated and purified HPV 58 L1 polypeptide comprising a sequence of amino acids as set forth in SEQ ID NO:2.